

Please Direct All Correspondence to Customer Number **20995**

APPEAL BRIEF

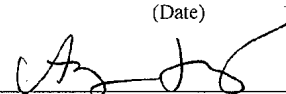
Applicant : Thagard, et al.
 App. No : 10/772,049
 Filed : February 4, 2004
 For : MODIFIED ASPHALTIC FOAM
 MATERIALS
 Examiner : Cooney, J.
 Art Unit : 1711

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August 20, 2007

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Agnes Juang, Ph.D., Reg. No. 55,310

Mail Stop Appeal Brief-Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

This appeal brief relates to an appeal to the Board of Patent Appeals and Interferences of the Final Rejection set forth in an Office Action electronically delivered on February 5, 2007.

In accordance with the Notice of Appeal filed May 4, 2007, Applicants submit this Appeal Brief.

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Filing Date : February 4, 2004

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I. REAL PARTY IN INTEREST

Pursuant to 37 C.F.R. §1.192, Appellant hereby notify the Board of Patent Appeals and Interferences that the real party in interest is the assignee for this application, DEVPAT, LLC, 13733 Valley Blvd., Fontana, CA 92335.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals or interferences.

III. STATUS OF CLAIMS

The above-identified application was filed with Claims 1-24. In response to the Office Action mailed July 20, 2005, Claim 1 was amended and Claims 25-30 were added. In response to the Office Action mailed January 10, 2006, Claim 1 was further amended. Claims 1-30 were finally rejected by the Examiner in the Final Office action sent electronically on February 5, 2007. Accordingly, Claims 1-30 are the subject of this appeal. The claims are attached hereto as Appendix A.

IV. STATUS OF AMENDMENTS

No amendments have been filed subsequent to the final rejection, and the claims before the Board appear as they were finally rejected.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is the only independent claim on this appeal. The subject matter of this claim relates to Applicants' discovery of a method for producing asphaltic foam. *See Application*, para. [0073]-[0080] beginning on page 16. The method comprises forming a first intermediate mixture and a second intermediate mixture, and then mixing the two intermediate mixtures to produce the asphaltic foam. Forming the first intermediate mixture involves the steps of providing an asphalt, liquefying said asphalt, and adding to said asphalt one or more isocyanates. *See Application*, para. [0073]-[0074] beginning on page 16. Then the temperature of the first intermediate mixture is brought to between about 120°F and 170°F. *See Application*, para. [0074] on page 17. The next step is forming a second intermediate mixture comprising one or

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more polyols, a blowing agent, and a surfactant. *See Application*, para. [0075]-[0077] on page 17. The second intermediate mixture is segregated from the first intermediate mixture. *See Application*, para. [0079] on page 18. The mixing of two intermediate mixtures involves first forcing the first intermediate mixture through a first impingement dispensing head and forcing the second intermediate mixture through a second impingement dispensing head. *See Application*, para. [0078] on page 17. Then the final reaction mixture is formed by mixing the first intermediate mixture forced through a first impingement dispensing head with the second intermediate mixture forced through a second impingement dispensing head. *See Application*, para. [0078] on page 17. The first intermediate mixture and the second intermediate mixture react and expand in a controllable manner such that the final reaction mixture does not expand beyond a form desired in a final molded asphaltic form or cure before taking on said form to produce the asphaltic foam. *See Application*, para. [0080] on page 18.

When using the method of this claim, asphalt foams can be formed under a temperature that is sufficiently low to allow for controlled reaction. *See Application*, para. [0082] beginning on page 18. The process will result in stronger foams, while the reaction mixture has a lower initial viscosity to make it flow easier in the mold. *See Application*, para. [0089] on page 20. The resulting asphaltic foam is strong and durable with molding ability, which allows it to be molded into any desired shape such as ridge caps. *See Application*, para. [0096] on page 22.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The Examiner has rejected Claims 1-30 under 35 U.S.C. §103(a) as being obvious over Roy, U.S. Pat. No. 4,225,678 ("Roy") alone or in view of Tzeng et al., U.S. Pat. No. 5,965,626 ("Tzeng").

VII. ARGUMENT

The Examiner has improperly rejected Claims 1-30 as obvious. The Examiner acknowledged that Roy discloses a "process for preparing asphaltic foams prepared by preparing molten asphalt and combining it with urethane forming reactants, blowing agent, surfactants, catalysts, and other materials at index values meeting those as claimed." *Final Office Action Electronically Delivered on February 6, 2007*, page 2, para. 4. However, the Examiner

maintained that it is within the purview of the ordinary practitioner having the teachings of Roy before them to add the asphalt component to any of the other ingredients prior to final work-up. *Id.* at pages 4, para. 2. The Examiner characterized the claimed invention as merely involving a change in the order of mixing the ingredients, and cited M.P.E.P. 2144.04 IV.C. in support of his assertion that selection of any order of mixing ingredients is *prima facie* obvious. *Id.* at pages 2-3, para. 5. However, as discussed in detail below, the claimed invention involves more than merely changing the order of mixing the ingredients.

The Examiner also alleged that the employment of multiple mixheads rather than a single mixhead to achieve the effects of mixing is within the purview of Roy's teaching. *Id.* at page 4, para. 6. In support of this allegation, the Examiner asserted that administration of separate materials using multiple conventional mixheads disclosed by Roy rather than mixing before or during passage through the mixhead in the claimed invention would have been "an obvious process manipulation within the disclosure of Roy for the purpose of achieving adequate mixing of materials." *Id.* at page 3, para. 1. However, as also discussed below, the use of a first and a second impingement dispensing head is an important component of Applicants' invention that is not suggested by the cited prior art, even in light of the process manipulation steps known to those having ordinary skill in the art.

A. *Prima Facie* Obviousness Has Not Been Properly Established Because the Cited References Do Not Teach or Suggest All the Claim Limitations.

According to M.P.E.P. 2143.03, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." The Examiner has not properly established *prima facie* obviousness because neither Roy alone nor in combination with Tzeng teaches or suggests (1) segregation of isocyanates and polyols or (2) forcing the two intermediate mixtures through two separate impingement dispensing heads to form a final reaction mixture.

1. Roy and Tzeng Fail to Teach or Suggest Segregation of Isocyanate and Polyols.

Roy teaches mixing all the ingredients together with molten asphalt in one step to form asphaltic foam. The Examiner insisted that Roy differs from the present claims in that the order

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of mixing the asphalt component is not specified as to require addition to the isocyanate component first, and thus it would have been obvious for one having ordinary skill in the art to have added the asphaltic component of Roy to any of the components disclosed first. *Id.* at pages 2, para. 5. However, the Examiner's characterization of the claimed process as requiring no more than changing the order of mixing the ingredients is erroneous. Rather than simply changing the order of mixing, the claimed invention requires that the ingredients first be separated into two groups to form two intermediate mixtures, and keeping the two intermediate mixtures segregated prior to combining them to form asphaltic foam.

Tzeng's process involves adding polyols to the molten asphalt to form an intermediate mixture, and the flowing agent and polyisocyanate were subsequently added to the intermediate mixture. Tzeng does not teach or suggest separating the reagents into two groups of intermediate mixtures. Nor does Tzeng disclose keeping these two intermediate mixtures segregated prior to combining them to form asphaltic foam.

Claim 1 of the present application recites, *inter alia*, "adding to said asphalt one or more isocyanates, thereby forming a first intermediate mixture" and "forming a second intermediate mixture comprising one or more polyols, a blowing agent, and a surfactant, wherein the second intermediate mixture is segregated from the first intermediate mixture." Neither Roy nor Tzeng disclose the creation of any separate groups of mixtures, much less the specific intermediate mixtures recited in Claim 1. Thus, for this reason alone, the combination of Roy with Tzeng cannot produce the teaching of the claimed invention required for a *prima facie* showing of obviousness.

Moreover, instead of mixing all the ingredients together to start the foaming reaction at once, asphalt and isocyanate are mixed together to form a first intermediate mixture, which is kept completely separated from the second intermediate mixture comprising polyols, blowing agent and the surfactant. Neither the creation of the first and second intermediate mixtures nor their segregation from each other is taught or suggested by either Roy or Tzeng. Accordingly, the combination of Roy with Tzeng fails to establish a *prima facie* obviousness for the §103(a) rejection for this reason as well.

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2. Roy and Tzeng Failed to Teach or Suggest Forcing the Two Intermediate Mixtures Through Separate Impingement Dispensing Heads to Form a Final Reaction Mixture.

The use of two impingement dispensing heads in the claimed invention is not an obvious process manipulation within the disclosure of Roy. The “impingement dispensing head” in the claimed invention is not the same as the conventional mixing head disclosed in Roy. Tzeng does not disclose any particular mixing head. Thus, neither Roy nor Tzeng disclose the use of the recited “impingement dispensing head.” Moreover, the Examiner has not cited any reason for the use of the recited “impingement dispensing head.” Thus, for this reason alone, a *prima facie* showing of obviousness cannot stand.

Furthermore, the recited impingement dispensing head serves a different purpose than the conventional mixing head described in Roy. In these prior art references, a conventional mixing head is used to combine all the ingredients to form the final mixture.¹ On the other hand, the two impingement dispensing heads in the claimed invention allow for the “first intermediate mixture and said second intermediate mixture react and expand in a controllable manner” as recited in Claim 1. This is accomplished by the impingement dispensing heads pumping out two intermediate mixtures at a controllable ratio, and all the ingredients in the two segregated intermediate mixtures being finally combined after passing through the two separate impingement heads to form the mixed materials. *See Application*, para. [0078] on page 17. Nothing in either Roy or Tzeng teaches or suggests such a process.

Since Roy’s process combines all ingredients before dispensing the final mixture out of the mixing head, it actually teaches away from mixing ingredients after dispensing through the dispensing heads in the claimed process. As a result, Roy also does not suggest the use of its mixing head in the process of claimed invention. Tzeng does not disclose the use of either mixing head or impingement dispensing head, and thus does not teach or suggest the use of two

¹ The specification of Roy recites “[t]he resulting mixture is then combined with the polyisocyanate, blowing agent and water in a conventional mixing head for polyurethane form.” *See Roy*, col. 7, ll. 22-24. Furthermore, the use of mixing head is also described in Example 1 as “[t]he resulting mixture is metered to a mixing head where it is combined with water, trichlorofluoromethane blowing agent and the polymethylene poly-phenylisocyanate...” and “[t]he four ingredients are combined proportionally in the mixing head....” *Id.*, col. 7, ll. 60-64.

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impingement dispensing heads. Accordingly, for this additional reason, the Examiner has failed to establish *prima facie* obviousness for the §103(a) rejection. Claims 2-30 depends on Claim 1 and further recite unique combination of features not taught or suggested by the cited art, and therefore are also allowable.

B. Clear and Convincing Evidence Showing Unexpected Results Commensurate In Scope with the Pending Claims Has Been Established.

Even if *prima facie* obviousness had been established (which it has not), it would be successfully rebutted by applicants' showing of unexpected results from the process of the present invention. As set forth in the Declaration of Casey Tzeng, filed with the amendment on November 28, 2006, Applicants performed the process of Roy and the process of the claimed invention, and compared the foam produced by these processes. Applicants noticed that it was necessary to keep the mixture of liquefied asphalt, a polyol and other standard additives at a high temperature (e.g., 200 °F) to produce a homogeneous mixture and prevent asphalt from separating out. *See Declaration of Casey Tzeng*, page 2, para. 3. Applicants then performed the method described in Roy to produce the asphaltic foam at 200 °F. Although the mixture did not separate, the process at this temperature resulted in a violent reaction and asphaltic foam that expanded beyond the mold into which it was poured, rendering the foam unsuitable for production of a usable molded product. *Id.* at pages 2-3, para. 4-5. Roy's process was then performed again at a temperature of less than 200 °F, and it resulted in the separation of the asphalt from the mixture and caused undesirable partial curing of the foam. *Id.* at page 3-4, para. 5. The resultant foam contained "stringy" asphalt. *Id.*

Applicants' process differs from Roy's process in that the ingredients in the claimed process were initially separated into two intermediate mixtures and segregated from each other. The mixtures in Applicants' invention were then brought together after being forced through respective impingement heads. Applicants surprisingly found that the asphalt did not separate from the mixture when asphalt was mixed with the isocyanate first to form a first intermediate mixture, which was also kept separately from the other ingredients in a second intermediate mixture. When Applicants' claimed process was performed at 125 °F, the intermediate mixture of asphalt and isocyanate was homogeneous. *Id.* at pages 4, para. 6. This enabled the claimed

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process to be performed at a lower temperature, which allowed for better control. *Id.* This result was in contrary to what would have been expected of Roy's process performed at the same temperature. By first forming two segregated intermediate mixtures, Applicants had discovered that the process of present invention is unexpectedly capable of producing asphalt foam without partial curing at a temperature low enough for a controlled foaming reaction.

Furthermore, the showing of unexpected results provided in the Declaration is, in fact, commensurate in scope with the pending claims. The pending claims recite a temperature of "between about 120°F and 170°F." Applicants had shown that Roy's process suffered from two problems that made the resultant foam unacceptable for molded product. First, a homogeneous mixture of asphalt, polyol and other standard additives can only be produced at high temperatures (e.g., 200 °F); therefore, the foam made by Roy's process at a temperature under 200 °F suffered from partial curing problem due to the asphalt separating from the mixture. *Id.*, pages 3-4, para. 5. Second, when Roy's process was performed at a temperature of 200 °F, the foaming reaction became too violent to be properly controlled for forming molded foam products. *Id.*, pages 2-3, para. 4. A skilled artisan would know that the homogeneity of a solution decreases as the temperature goes down, which means that the asphalt separation problem would be even more pronounced at a temperature lower than 200 °F. Thus, carrying out the Roy process at Applicants' recited temperature range would only make the problem identified in the Declaration worse.

Unlike Roy's process, no partial curing had occurred when Applicants' claimed process was carried out at 125 °F. The claimed process allowed the foaming to occur at a lower temperature without partial curing due to a more homogeneous mixing of asphalt and isocyanates. *Id.*, pages 4-5, paragraph 6. A person skilled in the art would understand that the homogeneity of a mixture increases as the temperature increases; therefore carrying out the claimed process at a temperature above around 125 °F would not encounter the asphalt separation and partial curing problems. As long as the foaming temperature is kept low enough to be controllable (less than 200 °F), a homogenous mixture would produce useful foam suitable for molded products. As a result, it is clear from the Declaration that the mixture of asphalt and

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isocyanate in the claimed process would be sufficiently homogeneous and the reaction would be controllable within the claimed range of "between about 120 °F and 170 °F."

The unexpected results of the claimed process would include the ability to prevent partial curing while keeping the foaming reaction controllable, which clearly could not be achieved by Roy's process within the claimed temperature range. Applicants not only have shown the unexpected results of the claimed process, but the showing of the unexpected results is also commensurate in scope with the pending claims. Accordingly, Applicants had successfully rebutted any *prima facie* obviousness asserted by the Examiner by the submission of the Declaration. Claims 2-30 depends on Claim 1 and further recite unique combination of features not taught or suggested by the cited art, and therefore are also allowable.

Conclusion

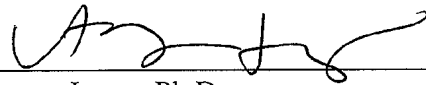
In view of the arguments presented above, Appellant submits that the pending claims are not obvious over Roy alone, or in view of Tzeng. First, the Examiner has failed to establish *prima facie* obviousness because Roy alone or combined with Tzeng does not teach or suggest all the claim limitations. Even if the *prima facie* obviousness has been found, Applicants' Declaration submitted with the response to the Office Action (filed November 28, 2006) would have provided clear and convincing evidence of unexpected results commensurate in scope with the pending claims to rebut *prima facie* obviousness. Appellant requests that the rejection under 35 U.S.C. § 103 be removed and that Claims 1-30 be allowed.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Date: 8/20/07

By: 
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APPENDIX A: CLAIMS

1. (Previously presented) A method for producing asphaltic foam comprising the steps of:

providing an asphalt;

liquefying said asphalt;

adding to said asphalt one or more isocyanates, thereby forming a first intermediate mixture;

bringing the temperature of said first intermediate mixture to between about 120°F and 170°F;

forming a second intermediate mixture comprising one or more polyols, a blowing agent, and a surfactant, wherein the second intermediate mixture is segregated from the first intermediate mixture;

forcing said first intermediate mixture through a first impingement dispensing head;

forcing said second intermediate mixture through a second impingement dispensing head; and

mixing said first intermediate mixture forced through said first impingement dispensing head with said second intermediate mixture forced through said second impingement dispensing head, thereby forming a final reaction mixture, wherein said first intermediate mixture and said second intermediate mixture react and expand in a controllable manner such that the final reaction mixture does not expand beyond a form desired in a final molded asphaltic foam or cure before taking on said form to produce said asphaltic foam.

2. (Original) The method of Claim 1, wherein the asphalt comprises the following components:

about 12-13% by weight asphaltene;

about 9-12% by weight saturated hydrocarbons;

about 38-44% by weight polar components; and

about 35-38% by weight naphthalene aromatic constituents.

3. (Original) The method of Claim 1, wherein the second intermediate mixture comprises at least one additional ingredient selected from the group consisting of catalyst and fire retardant.

4. (Original) The method of Claim 1, wherein the surfactant is a silicone surfactant.

5. (Original) The method of Claim 3, wherein the catalyst is a curing catalyst.

6. (Original) The method of Claim 3, wherein the fire retardant is TCPP.

7. (Original) The method of Claim 1, wherein the isocyanate is polymeric methylene diphenyl diisocyanate (MDI).

8. (Original) The method of Claim 1, wherein the first intermediate mixture comprises about 1:1 to about 1.5:1 polyisocyanate:asphalt.

9. (Original) The method of Claim 1, wherein the polyol is an amino-based polyol.

10. (Original) The method of Claim 1, wherein the blowing agent is selected from the group consisting of water, halocarbons, and mixture of ethanol and dibutylphthalate.

11. (Original) A method of forming a ridge cap or roofing tile comprising the steps of:

providing a conveyor belt;

applying a granule layer to said conveyor belt;

providing a mold with a top side open;

filling the mold with a reaction mixture produced by a method of Claim 1;

applying the mold with the open side down on said granule layer; and

curing the asphaltic foam; thereby forming the ridge cap or roofing tile.

12. (Original) The method of Claim 11, additionally comprising the step of forming an indentation on said granule layer after applying the granule layer on said conveyor belt.

13. (Original) The method of Claim 11, additionally comprising the step of applying a second granule layer having a contrasting color compared to the color of said first granule layer.

14. (Original) The method of Claim 11, wherein said mold comprises an indentation.

15. (Original) The method of Claim 11, further comprising applying a strip of modified asphalt onto the granule layer before applying the asphaltic foam.

16. (Original) The method of Claim 15, further comprising applying a fire resistant roofing underlayment onto the strip of modified asphalt.

17. (Original) The method of Claim 16, wherein the fire resistant roofing underlayment is a coated substrate product with fire-resistant qualities.

18. (Original) The method of Claim 11, wherein the second intermediate mixture comprises at least one additional ingredient selected from the group consisting of catalyst and fire retardant.

19. (Original) The method of Claim 18, wherein the catalyst is a curing catalyst.

20. (Original) The method of Claim 11, wherein the surfactant is a silicone surfactant.

21. (Original) The method of Claim 11, wherein the isocyanate is polymeric methylene diphenyl diisocyanate (MDI).

22. (Original) The method of Claim 11, wherein the first intermediate mixture comprises about 1:1 to about 1.5:1 polyisocyanate:asphalt.

23. (Original) The method of Claim 11, wherein the polyol is an amino-based polyol.

24. (Original) The method of Claim 11, wherein the blowing agent is selected from the group consisting of water, halocarbons, and mixture of ethanol and dibutylphthalate.

25. (Previously presented) The method of Claim 1, wherein the mixing step produces an initial cream time in which the final reaction mixture thickens.

26. (Previously presented) The method of Claim 1, wherein the initial cream time lasts for about 15 to 20 seconds.

27. (Previously presented) The method of Claim 1, wherein the mixing step lasts about 2 to 6 seconds.

28. (Previously presented) The method of Claim 25, wherein the initial cream time is followed by an expansion stage in which production of CO₂ causes expansion of the final reaction mixture.

29. (Previously presented) The method of Claim 1, wherein the blowing agent volatilizes during the expansion stage.

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30. (Previously presented) The method of Claim 1, further comprising
placing said final reaction mixture in a mold or placing a mold around the final
reaction mixture;
expanding the final reaction mixture in the mold; and
curing the expanded final reaction mixture.

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APPENDIX B: EVIDENCE

1. Declaration of Casey Tzeng submitted with Response to Office Action of May 31, 2006, filed November 27, 2006, and made of record in the Final Office Action electronically delivered February 5, 2007.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	George F. Thagard, III, et al.
Appl. No.	:	10/772,049
Filed	:	February 4, 2004
For	:	MODIFIED ASPHALTIC FOAM MATERIALS
Examiner	:	John M. Cooney
Group Art Unit	:	1711

DECLARATION OF CASEY TZENG

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Casey Tzeng, declare and state:

1. I have worked in the roofing industry for 27 years, and have developed methods for producing asphaltic foam for use in the manufacture of molded articles such as ridge caps and roofing tiles. I have extensive experience in the chemistry of asphalt and other components used in the manufacture of asphaltic foams. My resume is enclosed as Exhibit A. From 1979-1992, I was Plant Manager/Quality Control Manager at Lunday-Thagard Roofing/Asphalt Products, South Gate, California. From 1992-1993, I was a Process Engineer/Quality Control Manager at GS Roofing, South Gate/Wilmington, California. From 1993-2001, I was Director of Research and Development at Fontana Paper Mills, Fontana, California, the assignee of the present invention. At Fontana Paper Mills, I developed the company's asphalt specifications and developed asphalt extended rigid urethane foam for use in production of ridge cap and shingle roofing products. From 2001-2003, I was Vice President of Manufacturing at Malarkey Roofing, Portland, Oregon, where I identified new products for development and improved the overall quality of the existing product line. From 2003-2004, I was a consultant within the roofing

industry for both raw material suppliers and manufacturers. I am currently Director of Technical Services and Research and Development at Fontana Roofing Products, Fontana, California, where I am responsible for improving production efficiency, cost reduction and product quality improvement. I am leading development efforts for new product development.

2. I am familiar with the above-referenced application and pending claims. I have read the Office Action mailed May 31, 2006, and am very familiar with the Roy and Tzeng patents cited by the Examiner. In fact, I am a co-inventor of the Tzeng patent.

3. For 20 years, we had been trying to develop a process for making asphaltic foam suitable for preparation of ridge caps and other roofing materials. Our process involved combining liquefied asphalt, a polyol, and other standard additives into a mixture at high temperatures (e.g., 200°F). This high temperature was necessary to produce a homogeneous mixture or the asphalt would separate from the asphalt/polyol mixture. However, this resulted in an uncontrolled, violent reaction in which the resulting foam: 1) expanded beyond a mold into which the reaction mixture was placed; or 2) partially cured (hardened) before a mold was filled. Both of these occurrences resulted in molded articles (e.g., roofing tiles and ridge caps) that were incompletely formed or over-molded, and therefore unacceptable.

4. I performed the method described in the Roy patent to produce an asphaltic foam at 200°F. The contents of the mixtures used are shown in Table 1 below. Briefly, I mixed 36.5 g of asphalt with 73 g of polyol mixture (remaining components in Mixture B). The index ratio of isocyanate to asphalt/polyol mixture was 1.1-1.2.

Table 1

Mixture A

Component	Amount (g)	Type of compound
M 20 S	74.11	isocyanate

Mixture B

Component	Amount (g)	Type of compound
Saturant 701	36.5	asphalt
GP 430	10	Polyol
PLURACOL 355	25	Polyol
PLURACOL 975	25	Polyol
Dab.DC 5357	1.7	Surfactant
TCP	9.8	Flame retardant
Water	0.94	Blowing agent
Policat 8	0.3	Catalyst
Polecat 41	0.3	catalyst

When mixture A at ambient temperature was combined with mixture B at 200°F, the reaction was exceedingly violent and the foam could not be contained within a mold. Thus, this foam formulation was not suitable for production of a usable molded product.

5. In the method described in the foregoing paragraph, separation of the asphalt from the asphalt/polyol mixture was avoided by keeping the mixture at high temperature. However, as described above, the high temperature reaction was extremely violent. Thus, I also performed the method described in the foregoing paragraph at a temperature of less than 200°F. At the lower temperature, the asphalt separated from the asphalt/polyol mixture. The resulting foam contained

"stringy" asphalt due to undesirable partial curing of the foam, and was unsuitable for production of a molded product.

6. I also produced an asphaltic foam using the method described in the present claims. I prepared mixtures A and B as described in Table 2 below, but these mixtures were maintained at 125°F separately. Thus, the asphalt/isocyanate and polyol components were segregated. These two mixtures were put into a HITECH high pressure impingement machine and forced through separate impingement dispensing heads at an output of 8 lbs/min to combine the two mixtures. This resulted in a controlled reaction, and production of a proper foam that did not rise prior to filling a mold, and did not expand beyond a mold into which the reaction mixture was placed. Because the asphalt and isocyanate were totally homogeneous, there was no separation of the asphalt which enabled the reaction to be performed at a lower temperature, resulting in a more controlled reaction. This method unexpectedly allows the two mixtures to be combined at a lower temperature, resulting in a controlled reaction and a foam that can be used to make molded articles.

Table 2

Mixture A

Component	Amount (g)	Type of compound
Saturant 701	36.5	asphalt
M 20 S	74.11	isocyanate

Mixture B

Component	Amount (g)	Type of compound
GP 430	10	Polyol
PLURACOL 355	25	Polyol
PLURACOL 975	25	Polyol
Dab.DC 5357	1.7	Surfactant

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TCP	9.8	Flame retardant
Water	0.94	Blowing agent
Policat 8	0.3	Catalyst
Polecat 41	0.3	catalyst

7. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or patent issuing therefrom.

Dated: Nov. 27, 2006

By: Casey Tzeng
Casey Tzeng

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APPENDIX C: RELATED PROCEEDINGS

None.

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